

WHAT IS CLAIMED:

1. An articular implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein a portion or at least a portion of one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first and second articular surfaces.

2. The implant of claim 1 wherein the implant is placed within a joint selected from the group consisting of: knee, hip, shoulder, elbow, wrist, finger, toe, and ankle.

3. The implant of claim 1 wherein the superior surface and the inferior surface have a three dimensional shape that substantially matches the shape of at least one of the articular surface that the superior surface abuts and the inferior surface abuts.

4. The implant of claim 1 wherein the implant has a thickness of a cartilage defect in a patient.

5. The implant of claim 1 wherein the implant has a thickness of 85% of a cartilage defect in a patient.

6. The implant of claim 1 wherein the implant has a thickness of between 65%-100% of a cartilage defect of a patient.

7. The implant of claim 1 wherein the implant has a thickness of a cartilage defect in a patient plus an offset value.

8. The implant of claim 1 wherein the implant has a thickness of 85% of a cartilage defect in a patient plus an offset value.

9. The implant of claim 1 wherein the implant has a thickness of between 65%-100% of a cartilage defect of a patient plus an offset value.

5 10. The implant of claim 1 wherein the implant is constructed of a material comprising metal or metal alloy.

11. The implant of claim 1 wherein the material comprises one or more biologically active materials.

10 12. The implant of claim 10 wherein the implant is coated with a biologically active material.

13. The implant of claim 1 wherein the implant is comprised of a metal or metal alloy and a polymer.

15 14. The implant of claim 1 further having a structure for attachment on at least one of the first surface or the second surface selected from the group consisting of: ridges, pegs, pins, cross-members, teeth and protrusions.

15. The implant of claim 14 further having a plurality of structures for attachment.

20 16. The implant of claim 15 wherein the relative orientation of the structures for attachment are selected from the group consisting of: symmetrical, asymmetrical, rows, circles, triangles, and random.

17. The implant of claim 1 further having a peripheral structure selected from the group consisting of ridges and lips.

18. The implant of claim 17 wherein the peripheral structure extends along an entire perimeter of the implant.

19. The implant of claim 18 wherein the peripheral structure extends along a portion of a perimeter of the implant.

5 20. The implant of claim 1 wherein each of the first surface and second surface have a slope relative to a longitudinal axis through the implant and further wherein the slope of the first surface relative to the slope of the second surface is selected from the group consisting of: positive, negative, and null.

10 21. The implant of claim 1 wherein the implant approximates the shape of one of the first and second articular surface.

22. The implant of claim 21 wherein the implant is selected from a library of implants.

23. The implant of claim 1 wherein the implant changes configuration after insertion into a joint.

15 24. The implant of claim 1 wherein the implant changes configuration during loading.

25. The implant of claim 1 wherein the implant further comprises a first component and a second component.

20 26. The implant of claim 25 wherein the first and second component are one of: integrally formed, indivisibly formed, interconnectedly formed, and interdependently formed.

27. The implant of claim 25 wherein the first component engages the joint in at least one of fixedly, slideably, rotatably.

28. The implant of claim 25 wherein the second component engages the joint in at least one of fixedly, slidably, and rotatably.

29. The implant of claims 25, 26, 27, and 28 wherein the first component engages the second component.

5 30. The implant of claims 25, 26, 27, and 28 wherein the first component fits within the second component.

31. The implant of claims 25, 26, 27, and 28 wherein the first component slideably engages the second component.

10 32. The implant of claims 25, 26, 27, and 28 wherein the first component rotatably engages the second component.

33. The implant of claims 25, 26, 27, and 28 wherein a portion of the implant has a magnet.

34. The implant of claim 1 wherein the implant has a plurality of components.

15 35. The implant of claim 34 wherein a first component of the plurality of components engages the joint in at least one of fixedly, slideably, and rotatably.

36. The implant of claim 34 wherein a second component of the plurality of components engages the joint in at least one of fixedly, slidably, and rotatably.

20 37. The implant of claims 34, 35 and 36 wherein the first component of the plurality of components engages the second component of the plurality of components.

38. The implant of claims 34, 35 and 36 wherein the first component of the plurality of components fits within the second component of the plurality of components.

5 39. The implant of claims 34, 35 and 36 wherein the first component of the plurality of components slideably engages the second component of the plurality of components.

40. The implant of claims 34, 35 and 36 wherein the first component of the plurality of components rotatably engages the second component of the plurality of components.

10 41. The implant of claims 34, 35 and 36 wherein the first component of the plurality of components rotatably and slidably engages the second component of the plurality of components.

15 42. The implant of claim 1 wherein the implant has a shape formed along a perimeter selected from the group consisting of: circular, elliptical, ovoid, kidney shaped, substantially circular, substantially elliptical, substantially ovoid, and substantially kidney shaped.

20 43. The implant of claim 1 wherein the implant has a cross-sectional shape of at least one of an inferior surface and a superior surface selected from the group consisting of spherical, hemispherical, aspherical, convex, concave, substantially convex, and substantially concave.

44. The implant of claim 1 wherein the implant is a cartilage defect conforming implant.

45. The implant of claim 1 wherein the implant is a cartilage projected implant.

46. The implant of claim 1 wherein the implant is a subchondral bone conforming implant.

47. The implant of claim 1 wherein the implant is surgically implanted via an incision of 10 cm or less.

5 48. The implant of claim 1 wherein the implant is surgically implanted via an incision of 6 cm or less.

49. The implant of claim 1 wherein the implant is surgically implanted via an incision of 4 cm or less.

10 50. The implant of claim 1 wherein the range of motion of the joint is restored to between 80-99.9% of normal joint motion.

51. The implant of claim 1 wherein the range of motion of the joint is restored to between 90-99.9% of normal joint motion.

52. The implant of claim 1 wherein the range of motion of the joint is restored to between 95-99.9% of normal joint motion.

15 53. The implant of claim 1 wherein the range of motion of the joint is restored to between 98-99.9% of normal joint motion.

20 54. The implant of claim 1 wherein the joint is a knee joint and wherein a shape formed along a perimeter selected from the group consisting of: circular, elliptical, ovoid, kidney shaped, substantially circular, substantially elliptical, substantially ovoid, and substantially kidney shaped.

55. The implant of claim 1 wherein the joint is a knee joint and wherein the superior surface of the implant is substantially convex.

56. The implant of claim 1 wherein the joint is a knee joint and wherein the inferior surface of the implant is substantially concave.

57. The implant of claim 1 wherein the joint is a knee joint and wherein the superior surface of the implant is comprised of convex and concave sections.

5 58. The implant of claim 1 wherein the joint is a knee joint and the inferior surface of the implant is substantially concave.

59. The implant of claim 1 wherein the joint is a hip joint and wherein a cross-section of the implant is selected from the group consisting of: spherical and aspherical.

10 60. The implant of claim 1 wherein a periphery of the implant is of greater thickness than a central portion of the implant.

61. The implant of claim 1 wherein a central portion of the implant is of greater thickness than a periphery.

15 62. The implant of claim 1 having an anterior portion, posterior portion, lateral portion and medial portion wherein the implant has a thickness along the posterior portion of the device that is equal to or greater than a thickness of at least one of the lateral, medial and anterior portion of the implant.

20 63. The implant of claim 1 having an anterior portion, posterior portion, lateral portion and medial portion wherein the implant has a thickness along a posterior portion of the device that is equal to or less than a thickness of at least one of the lateral, medial and anterior portion of the implant.

64. The implant of claim 1 having an anterior portion, posterior portion, lateral portion and medial portion wherein the implant has a thickness along a

medial portion of the device that is equal to or less than a thickness of at least one of a anterior portion, posterior portion, and lateral portion.

5 65. The implant of claim 1 having an anterior portion, posterior portion, lateral portion and medial portion wherein the implant has a thickness along a medial portion of the device that is equal to or greater than a thickness of at least one of a anterior portion, posterior portion, and lateral portion.

10 66. The implant of claims 25 and 34 having an anterior portion, posterior portion, lateral portion and medial portion wherein at least one component of the implant has a thickness along the posterior portion of the device that is equal to or greater than a thickness of at least one of the lateral, medial and anterior portion of the implant.

15 67. The implant of claims 25 and 34 having an anterior portion, posterior portion, lateral portion and medial portion wherein at least one component of the implant has a thickness along a posterior portion of the device that is equal to or less than a thickness of at least one of the lateral, medial and anterior portion of the implant.

20 68. The implant of claims 25 and 34 having an anterior portion, posterior portion, lateral portion and medial portion wherein at least one component of the implant has a thickness along a medial portion of the device that is equal to or less than a thickness of at least one of a anterior portion, posterior portion, and lateral portion.

69. The implant of claims 25 and 34 having an anterior portion, posterior portion, lateral portion and medial portion wherein at least one component of the implant has a thickness along a medial portion of the device

that is equal to or greater than a thickness of at least one of a anterior portion, posterior portion, and lateral portion.

5 70. A procedure for repairing a joint comprising the step of arthroscopically implanting or implanting with arthroscopic assistance an implant having a first and second surface wherein at least one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of an articular surface.

 71. The procedure of claim 70 further comprising the step of analyzing an image of the joint prior to implantation.

10 72. The procedure of claim 70 wherein the image is a three-dimensional image selected from the group consisting of MRI, CT, x-ray, and combinations thereof.

 73. The procedure of claim 70 further comprising the step of making an incision of 10 cm or less.

15 74. The procedure of claim 70 further comprising the step of making an incision of 6 cm or less.

 75. The procedure of claim 70 further comprising the step of making an incision of 4 cm or less.

20 76. A method of making an implant suitable for a joint, the method comprising the steps of:

 determining three-dimensional shapes of one or more articular surface of the joint; and

producing an implant having a first surface and a second surface,
wherein the first surface and second surface oppose a first and second
articular surface of the joint and further wherein a portion or all of at least
one of the first or second surfaces substantially matches the three-
dimensional shape of the articular surface.

77. The method of claim 76 wherein the three-dimensional shape is
determined by obtaining an image of the joint.

78. The method of claim 77 wherein the image is selected from the
group consisting of MRI, CT, x-ray, and combinations thereof.

79. An articular implant having a first surface and a second surface
wherein the first surface opposes a first articular surface of a joint and the second
surface opposes a second articular surface of the joint and further wherein at
least a portion of at least one of the first or second surfaces has a three-
dimensional shape that approximates the shape of one of the first and second
articular surfaces.

80. A cartilage defect conforming implant having a first surface and a
second surface wherein the first surface opposes a first articular surface of a joint
and the second surface opposes a second articular surface of the joint and
further wherein at least a portion of at least one of the first or second surfaces
has a three-dimensional shape that substantially matches the shape of one of the
first and second articular surfaces.

81. A cartilage defect conforming implant having a first surface and a
second surface wherein the first surface opposes a first articular surface of a joint
and the second surface opposes a second articular surface of the joint and
further wherein at least a portion of at least one of the first or second surfaces

has a three-dimensional shape that approximates the shape of one of the first and second articular surfaces.

5 82. A cartilage projected implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein at least a portion of at least one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first and second articular surfaces.

10 83. A cartilage projected implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein at least a portion of at least one of the first or second surfaces has a three-dimensional shape that approximates the shape of one of the first and second articular surfaces.

15 84. A subchondral bone conforming implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein at least a portion of one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first
20 and second articular surfaces.

25 85. A subchondral bone conforming implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein at least a portion of one of the first or second surfaces has a three-dimensional shape that approximates the shape of one of the first and second articular surfaces.

86. A subchondral bone projected implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein at least a portion of one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first and second articular surfaces.

87. A subchondral bone projected implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and the second surface opposes a second articular surface of the joint and further wherein at least a portion of one of the first or second surfaces has a three-dimensional shape that approximates the shape of one of the first and second articular surfaces.

88. An articular implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and second surface opposes a second articular surface of a the joint and further wherein at least a portion of one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first and second articular surfaces and further wherein the implant restores joint movement to from 90-99.9% of natural joint mobility.

89. An implant having a first surface and a second surface wherein the first surface opposes a first articular surface of a joint and second surface opposes a second articular surface of a the joint and further wherein at least a portion of one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first and second articular surfaces further wherein the implant can withstand 100% of the shear forces applied to the joint.

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90. An implant suitable for a joint of a mammal wherein the joint has a first joint surface and a second joint surface wherein the implant has a first surface and a second surface wherein the first surface opposes at least a portion of a first articular surface and the second surface opposes at least a portion of a second articular surface and further wherein at least a portion of at least one of the first or second surfaces has a three-dimensional shape that substantially matches the shape of one of the first joint surface and the second joint surface.